3.38 Reacquisition Functional Element Sensitivity

RADGUNS is capable of reacquiring the target following a break lock or masking of the target by a hill. Subroutine REACQR computes boresight azimuth, elevation, and range during the manual aiming of the radar antenna. Time to reestablish autotrack is controlled by user inputs, which are usually varied to assess relative effects on shooting performance.

The reacquisition function in *RADGUNS* is sensitive to the user-defined input which delays resumed autotrack of the target by exactly the number of seconds specified. For reacquisition to occur, break lock in a simulated engagement must occur, which triggers the user-specified time delay during manual pointing of the radar antenna toward the target and reacquisition. Because break lock and reacquisition affect tracking performance (by reducing tracking and shooting time during an engagement), hit probabilities will also be dependent upon the execution of this functional element. The predetermined reacquisition time must be estimated for levels of human operator performance on the selected threat system.

Data Items Required

Data Item		Accuracy	Sample Rate	Comments
12.1.1	Time to reacquire	±1 s	SV/T	

3.38.1 Objectives and Procedures

Because break lock and reacquisition affect tracking performance by reducing tracking and shooting time during an engagement, hit probabilities will be dependent upon the execution of this functional element. However, reacquisition delay is insensitive to any other parametric variance. The predetermined reacquisition time must be based upon estimates of human operator performance on the selected threat system. Rather than conducting a sensitivity analysis for this model input parameter, a simple assessment to demonstrate its predictable effect was performed. Accuracy of time measurements should be to the nearest second for comparison with the model.

A simple assessment matrix shown in Table 3.38-1 was formulated to illustrate the reacquisition effect on *RADGUNS* output. Figure 3.38-1 depicts the geometry used for this assessment. The flight path and hill locations were chosen to cause a break lock due to masking and a subsequent unmasking to test the reacquisition capability. Several runs were also made with reacquisition values greater than 10 seconds to assess simulation response.

TABLE 3.38-1. Reacquisition Assessment Matrix.

Parameter	Condition	Reacquisition Time Settings
Target altitude	200 m	1 s
Target velocity	100 m/s	2 s
Hill length	50 m	4 s
Hill orientation	Parallel	8 s
Flight path length	8000 m	>10 s

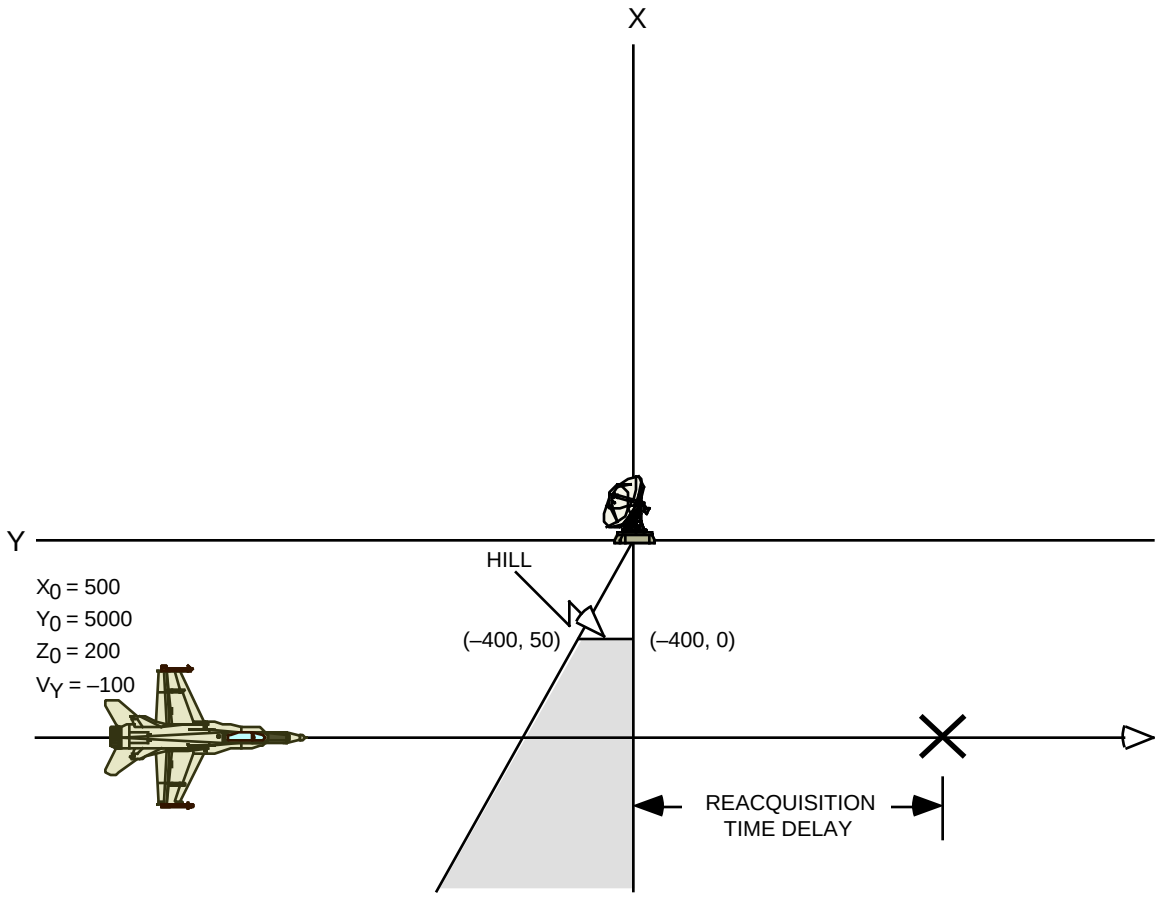

FIGURE 3.38-1. Reacquisition Assessment Geometry.

3.38.2 Results

Simulation of reacquisition delay was equal to specified input values. Results are shown in Table 3.38-2.

TABLE 3.38-2. Reacquisition Assessment Results.

Reacquisition Time Setting	Reacquisition Time Observed
1	1
2	2
4	4
8	8
>10	Defaults to 10

NOTE: Time measured in seconds.

3.38.3 Conclusions

The reacquisition function in *RADGUNS* performs according to specification. After break lock occurs, the simulation will delay reacquisition for the user-selected amount of time after the target becomes unmasked. For values greater than 10 s, the simulation defaults to 10 s of reacquisition delay. The key to realistic selection of reacquisition time is predicting human performance under various break-lock and target flight path conditions. This data must be acquired and analyzed to provide accurate reacquisition time specifications for a variety of conditions. *RADGUNS* currently simulates user-input delay which may or may not be accurate for a set of conditions.